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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,331	10/31/2003	Ki-Tae Park	HALO02-005	2538

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EXAMINER	
TRAN, MICHAEL THANH	
ART UNIT	PAPER NUMBER
2827	

DATE MAILED: 04/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/699,331	Applicant(s) PARK ET AL.	
	Examiner Michael t. Tran	Art Unit 2827	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *October 31, 2003 through January 29, 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *10-32* is/are allowed.

6)☒ Claim(s) *1* is/are rejected.

7)☒ Claim(s) *2-9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *012904*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

MICHAEL TRAN
PRIMARY EXAMINER

DETAILED ACTION

1. In response to the Communications dated October 31, 2003 through January 29, 2004, claims 1-32 are active in this application.

Information Disclosure Statement

2. The information disclosure statement filed January 29, 2004 has been considered.

Claim Objections

3. Claims 2-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Also it is noted that an –and—should be inserted in the claims where appropriate.

Claim Rejections – 35 U.S.C. § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published

under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

5. Claim 1 is rejected under 35 U.S.C 102(e) as being anticipated by Yamazaki et al. [U.S. Patent #6,768,354].

With respect to claim 1, Yamazaki et al. disclose, in figure 1, a program verify circuit for nonvolatile memory cells, comprising: a) a nonvolatile memory chip [MA], b) a bit line read path [within MA], c) a reference read path [within MA], d) a voltage control circuit [CTL] connected in said bit line read path and said reference read path, e) a sense amplifier [SA], f) an equalizer circuit [2] to make voltages stored on the bit line read path and the reference read path a same amplitude [VDDL/VDDH having the same amplitude – see figure 4], and g) an output node of the bit line read path and the output node of the reference read path connected to said sense amplifier inputs [both are within MA].

Allowable Subject Matter

6. Claims 10-32 are allowable over the prior art of record.

7. The following is an Examiner's statement of reasons for the indication of allowable subject matter: the prior art of records does not show (in addition to the other elements in the claim) the following:

- Selecting said memory cell allowing said bit line to be discharged, and if said bit line voltage drops to below a predetermined voltage level, then coupling said bit

line voltage to said output node of the bit line read path and discharging to output node of the bit line read path to a voltage below said precharge voltge, and comparing output voltages of the bit line read path and the reference line read path using said sense amplifier to determine if the selected cell is programmed.

- Means for discharging said output node to a voltage below said predetermined voltage when said nonvolatile memory cell is in an erase state, and a means for comparing voltages on said output node and said reference line to determined if said memory cell has been programmed.
- Said sense amplifier compares said verify reference voltage to said bias voltage if said memory cell is programmed, and said sense amplifier compares said verify reference voltage to an erased cell voltage if said memory cell is erased.
- Coupling a verify reference voltage and an output voltage of said output node to sense amplifier inputs, and comparing said verify reference voltage and said output voltage to determine if said memory cell is programmed.
- A means for isolating said bit line from an output node of a bit line read path thereby allowing said output node to further charge to a chip bias voltage when memory cell is programmed, and a means for comparing said verify reference voltage to a voltage on said output node after a predetermined amount of time.

Conclusion

8. When responding to the Office action, Applicants are advised to provide the Examiner with line and page numbers of the application and/or references cited

to assist the Examiner in the prosecution of this case.

9. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Michael T. Tran whose telephone number is (571) 272-1795. The Examiner can normally be reached on Monday-Thursday from 7:30-6:00 P.M.

10. Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (571) 272-1650.

Michael T. Tran
Art Unit 2827
April 15, 2005

MICHAEL TRAN
PRIMARY EXAMINER